



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/570,349

03/03/2006

Kouichi Takei

120446017X00

7124

20457 7590 04/14/2009
ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

ETHERIDGE, EMPRESS A

ART UNIT

PAPER NUMBER

4111

MAIL DATE

DELIVERY MODE

04/14/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/570,349	Applicant(s) TAKEI ET AL.	
	Examiner Empress Etheridge	Art Unit 4111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
 4a) Of the above claim(s) 5, 8 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 10 and 11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/17/2008 and 08/28/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

- I. Claim(s) 1-4 and 6-11, drawn to a negative electrode material.
- II. Claim(s) 5, drawn to a method of making a negative electrode material.

The inventions are distinct, each from the other because of the following reasons:

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the common features (carbon coated graphite particles) of groups I and II do not provide a contribution over the prior art. See Takei et al., Composite Carbon Particle, Its Production, Negative Pole Material, Negative Pole for Lithium Secondary Battery or Cell and Lithium Secondary Battery or Cell, which is indicated as an "X" reference in the International Search Report. Therefore, the common features of groups I and II are not special technical features.

During a telephone conversation with William Solomon on April 2, 2009 a provisional election was made without traverse to prosecute the invention of group I, claims 1-4 and 6-11. Affirmation of this election must be made by applicant in replying

Art Unit: 4111

to this Office action. Claims 5, 8, and 9 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention or dependent upon a non-elected invention.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

DETAILED ACTION

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation of “block-like structure” of flat graphite particles.

The specification does not provide any guidance as to the definitive structure of these particles. The specification merely recites the term “block-like structure” (abstract and [0009], line 3) without providing any clear definition as to the attributes of the

Art Unit: 4111

particles that allow them to be described as such. A clear definition of the term “block-like structure” is required that is indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-4, 6-7, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takei et al. (J.P. 2000-203818) (“Takei”) in view of Ishii et al. (U.S. Pub. No. 2001/0033822) (“Ishii”).

7. Regarding claim 1, Takei teaches a negative pole material for a lithium secondary battery (title and paragraph [0002]), which is the equivalent of applicants' non-aqueous electrolyte secondary battery negative electrode material. Takei teaches a flat shaped, non-spherical, non-parallel shape of particles (see paragraph [0021] and claim 5), which is the equivalent of applicants' graphite particles that have a block like

Art Unit: 4111

structure where a plurality of flat graphite fine particles assemble or bonds non-parallel with each other. Takei teaches particles have fine pores of 0.4-2.0 cc/g in the range of 0.1-100 μ m (see paragraph [0012] and claim 5), which is the equivalent of applicants' volume of fine pores in the range of 10 to 10⁵ nm in a volume of 40 to 2000 cm³/kg.

Takei teaches a compound carbon particle which has the structure which a graphite grain is covered with amorphous carbon (see paragraph [0011]), which is the equivalent of applicants' layer of carbon formed on a surface of the graphite particle.

Takei fails to explicitly teach the aspect ratio is 5 or less or that the ratio (by weight ratio) of the layer of carbon to the graphite particle is in the range of 0.001 to 0.01.

However, Ishii teaches a graphite particle obtained by assembling or binding together a plurality of flat-shaped particles so that the planes of orientation are not parallel to one another, having a pore volume of the pores having a size falling in a range of 10² to 10⁶ Å is 0.4 to 2.0cc/g per weight of graphite particle, and that the aspect ratio of said graphite particle is 5 or less (see abstract). Ishii also teaches that the use of this graphite particle as negative electrode material provides for excellent rapid charge-discharge characteristics and cycle characteristics (see abstract).

Therefore, it would have been obvious to a person having ordinary skill in the art to combine the prior art references by using the graphite particle as described by Ishii as the graphite part of the lithium secondary battery of Takei for the benefit of improved efficiency of the lithium secondary battery.

Also, Ishii teaches a graphite paste (negative electrode) produced by mixing graphite particles with an organic binder such as tar or pitch (carbon) (see paragraphs [0065]; and [0071]). Ishii teaches that the mixing ratio between the graphite particles and the organic binder is 3 parts by weight of the organic binder (carbon) per 100 parts by weight of graphite particles (see paragraph [0075]). Thus, the ratio (by weight ratio) of the organic binder (carbon) to the graphite particle is 0.03. If the mixing ratio is 1 part by weight organic binder (carbon) per 100 parts by weight of graphite particles (0.01 by weight ratio) these compounds would be expected to have similar properties to one where the organic binder (carbon) is 3 parts by weight per 100 parts by weight of graphite particles (0.03 by weight ratio). It would have been obvious to a person having ordinary skill in the art to optimize this range for the benefit of excellent rapid charge-discharge characteristics and cycle characteristics and to recognize that this slight variation in numbers would not affect the properties of the carbon-graphite mixture. In addition, differences in weight percent will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Furthermore, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (see MPEP § 2144.05).

Art Unit: 4111

Regarding claim 2, Takei teaches a mean particle diameter of $28\mu\text{m}$ (see paragraph [0044]), which is the equivalent of applicants' average particle diameter is $10\mu\text{m}$ or more and $50\mu\text{m}$ or less. Takei teaches the specific surface area of the compound carbon particle obtained is $2.5\text{m}^2/\text{g}$ and the value is measured in accordance with the BET adsorption method (see paragraph [0044]), which is the equivalent of applicants' specific surface area measured by a BET method is $2.0\text{m}^2/\text{g}$ or more and $5.0\text{m}^2/\text{g}$ or less.

Takei fails to explicitly teach the true specific gravity is 2.22 or more, the bulk density is $780\text{kg}/\text{m}^3$ or more or that in a Raman spectrum analysis with argon laser light of wavelength of 5145\AA , an R value expressed by $R=I_{1350}/I_{1580}$ is less than 0.2.

However, these properties are inherent. It is known that if a material is found that is substantially the same as the present material the properties of said material are inherent. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990) (see MPEP § 2112.01). "[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." Atlas Powder Co. v. Ireco Inc.,

Art Unit: 4111

190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977) (see MPEP § 2112.01). “[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency’ under 35 U.S.C. 102, on prima facie obviousness’ under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same.” The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)) (see MPEP § 2112).

Regarding claim 3, Takei does not specifically teach the viscosity is 0.5Pas or more or 4.0 Pas or less, measured under any specified conditions. However, these properties are inherent considering the material used is substantially the same as the material disclosed in the instant application. See above rationale of claim 2.

Regarding claim 4, Takei does not explicitly teach the bulk density under pressure of 33MPa is 1850kg/m³ or the rate of variation of the bulk density when the pressure is released is 0.3 or less. However, these properties are inherent considering the material used is substantially the same as the material disclosed in the instant application. See above rationale of claim 2.

Regarding claim 6, Takei teaches a compound carbon particle which has the structure which a graphite grain is covered with amorphous carbon suitable as the

Art Unit: 4111

negative pole material (see title and paragraphs [0011] and [0013]), which is the equivalent of applicants' non-aqueous electrolyte secondary battery negative electrode which includes the negative electrode material of claim 1.

Regarding claim 7, Takei teaches a lithium secondary battery having a negative pole material which is a compound carbon particle which has the structure in which a graphite grain is covered with amorphous carbon (see abstract and paragraphs [0011] and [0013]), which is the equivalent of applicants' non-aqueous electrolyte secondary battery having as the negative electrode, the non-aqueous electrolyte secondary battery negative electrode of claim 6.

Regarding claim 10, Takei does not specifically teach the viscosity is 0.5Pas or more or 4.0 Pas or less, measured under any specified conditions. However, these properties are inherent considering the material used is substantially the same as the material disclosed in the instant application. See above rationale of claim 2.

Regarding claim 11, Takei does not explicitly teach the bulk density under pressure of 33MPa is 1850kg/m^3 or the rate of variation of the bulk density when the pressure is released is 0.3 or less. However, these properties are inherent considering the material used is substantially the same as the material disclosed in the instant application. See above rationale of claim 2.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Empress Etheridge whose telephone number is

Art Unit: 4111

(571)270-7892. The examiner can normally be reached on Monday- Friday 8:30-5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. E./
Examiner, Art Unit 4111

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795